

IN THE UNITED STATES DISTRICT COURT  
FOR THE MIDDLE DISTRICT OF NORTH CAROLINA

FUMA INTERNATIONAL LLC,  
an Ohio limited liability company,

*Plaintiff/Counterdefendant,*

v.

R.J. REYNOLDS VAPOR  
COMPANY,  
a North Carolina corporation,

*Defendant/Counterplaintiff.*

Civil Action No. 1:19-cv-260

and

Civil Action No. 1:19-cv-660

**REYNOLDS'S TRIAL BRIEF**

## **TABLE OF CONTENTS**

I.	Summary of Issues to be Determined at Trial .....	1
II.	Patent Invalidity .....	2
A.	Obviousness .....	2
1.	Legal Standard .....	2
2.	The Priority Date of the Patents-In-Suit .....	4
3.	The Purported Novelty of the Asserted Claims .....	4
4.	The Smoke 51 Duo’s Heating Element.....	8
5.	Other Prior Art .....	9
B.	Derivation.....	16
III.	Infringement.....	17
A.	Legal Standards .....	17
B.	Claim Language, Specification, and Prosecution History of the ’604 Patent .....	19
C.	Literal Infringement .....	21
D.	Infringement Under the Doctrine of Equivalents.....	23
1.	Prosecution History Estoppel.....	23
2.	No Infringement by Equivalence .....	24
IV.	Willful Infringement .....	26
V.	Damages.....	29
A.	Reasonable Royalty.....	29
B.	Fuma’s Damages Theory .....	30
C.	Reynolds’s Damages Theory .....	33
D.	Lump Sum for Past and Future Damages .....	34

## **TABLE OF AUTHORITIES**

### **Cases**

<i>Aeroquip Corp. v. U.S.</i> , 37 Fed.Cl. 139 (1997) .....	25
<i>Amgen Inc. v. Coherus BioSciences Inc.</i> , 931 F.3d 1154 (Fed. Cir. 2019) .....	18
<i>Bayer Healthcare LLC v. Baxalta Inc.</i> , 989 F.3d 964 (Fed. Cir. 2021) .....	26
<i>Bristol-Myers Squibb Co. v. Ben Venue Labs., Inc.</i> , 246 F.3d 1368 (Fed. Cir. 2001).....	2
<i>Buildex, Inc. v. Kason Indus., Inc.</i> , 849 F.2d 1461 (Fed. Cir. 1988).....	2
<i>Exmark Manufacturing Company, Inc. v. Briggs &amp; Stratton Power Products Group, LLC</i> , 879 F.3d (Fed. Cir. 2018) .....	30
<i>Felix v. Am. Honda Motor Co., Inc.</i> , 562 F.3d 1167 (Fed. Cir. 2009) .....	19
<i>Fromson v. Advance Offset Plate, Inc.</i> , 755 F.2d 1549 (Fed. Cir. 1985) .....	2
<i>Graham v. John Deere Co.</i> , 383 U.S. 1 (1966) .....	3, 4
<i>Halo Elecs., Inc. v. Pulse Elecs., Inc.</i> , 136 S. Ct. 1923 (2016) .....	26
<i>Interlink Electronics v. Incontrol Solutions, Inc.</i> , No. 98-1567, 1999 WL 641230 (Fed. Cir. Aug. 24, 1999) .....	17
<i>KSR Intern. Co. v. Teleflex Inc.</i> , 550 U.S. 398 (2007) .....	3
<i>LaserDynamics v. Quanta Computer, Inc.</i> , 694 F.3d 51 (Fed. Cir. 2012) .....	30
<i>Lucent Techs., Inc. v. Gateway, Inc.</i> , 2007 WL 925354 (S.D. Cal. Mar. 6, 2007).....	24, 29
<i>Mas-Hamilton Group v. LaGard, Inc.</i> , 156 F.3d 1206 (Fed. Cir. 1998).....	17
<i>Microsoft Corp. v. I4I Ltd. P’ship</i> , 564 U.S. 91 (2011).....	3

<i>Microsoft Corp. v. Multi-Tech Systems, Inc.</i> , 357 F.3d 1340 (Fed. Cir. 2004) .....	18
<i>Morton Intern., Inc. v. Cardinal Chemical Co.</i> , 5 F.3d 1464 (Fed. Cir. 1993) .....	17
<i>Pharma Tech Solutions, Inc. v. LifeScan, Inc.</i> , 942 F.3d 1372 (Fed. Cir. 2019) .....	18, 23
<i>Planet Bingo, LLC v. GameTech Intern., Inc.</i> , 472 F.3d 1338 (Fed. Cir. 2006) .....	17
<i>Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.</i> , 904 F.3d 965 (Fed. Cir. 2018) .....	30
<i>Richdel, Inc. v. Sunspool Corp.</i> , 714 F.2d 1573 (Fed. Cir. 1983) .....	1
<b>Statutes</b>	
35 U.S.C. § 103(a) .....	3
35 U.S.C. § 284 .....	29
35 U.S.C. § 287(a) .....	29

## **I. Summary of Issues to be Determined at Trial**

This case involves Reynolds's alleged infringement of two patents: U.S. Patent Nos. 9,532,604 ("604 patent") and 10,334,881 ("881 patent") (collectively, "Patents-in-Suit"), by making and selling two products: the VUSE Solo and VUSE Ciro (the "Accused Products"). (Dkts.76-2; 76-3.) The Court has determined that the Accused Products infringe the '881 Patent and that the Ciro also infringes the '604 patent, leaving the following issues to be determined:

1. Whether the Patents-in-Suit are valid?
2. If the Patents-in-Suit are valid, whether the VUSE Solo infringes claims 4, 6, 12, 14, 16 or 18 of the '604 patent?
3. If the Patents-in-Suit are valid, did Reynolds willfully infringe them?
4. If the Patents-in-Suit are valid, what damages should be awarded to Fuma?<sup>1</sup>

The issue of invalidity is potentially dispositive of all issues because if the Patents-in-Suit are invalid, there is no reason to consider infringement, damages and willfulness. *See Richdel, Inc. v. Sunspool Corp.*, 714 F.2d 1573, 1580 (Fed. Cir. 1983). Fuma bears the burden of proof on the issues of infringement, willful infringement, and damages; while Reynolds bears the burden of proof on invalidity.

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<sup>1</sup> Whether enhanced damages should be awarded is a separate issue for the Court to determine.

Because of this division in the burdens, “[t]here is a normal or customary sequence in which proofs are presented during the course of a patent infringement trial: (1) the plaintiff first presents proof on the issue of infringement as its *case-in-chief*; (2) the defendant then presents proof on the issues of patent validity and unenforceability, as its *case-in-reply*; (3) followed by any proof by the plaintiff on the issues of validity and unenforceability, as *rebuttal*; and (4) any final rejoinder by the defendant, as *surrebuttal*.” 6 John Gladstone Mills III, et al., *Patent Law Fundamentals* § 20:103 (2021).

## **II. Patent Invalidity**

### **A. Obviousness**

#### **1. Legal Standard**

Although a patent is presumed valid, the presumption is considered procedural, rather than substantive. *Fromson v. Advance Offset Plate, Inc.*, 755 F.2d 1549, 1555 (Fed. Cir. 1985). The presumption can be overcome by clear and convincing evidence. *Bristol-Myers Squibb Co. v. Ben Venue Labs., Inc.*, 246 F.3d 1368, 1374 (Fed. Cir. 2001). Under this standard, “proof need not be airtight.” *Buildex, Inc. v. Kason Indus., Inc.*, 849 F.2d 1461, 1464 (Fed. Cir. 1988). “The law requires persuasion not perfection.” *Id.* Moreover, the USPTO’s decision of patentability “is never binding on a court.” *Fromson*, 755 F.2d at 1555. “[I]f the

PTO did not have all material facts before it, its considered judgment may lose significant force. And, concomitantly, the challenger's burden to persuade the jury of its invalidity defense by clear and convincing evidence may be easier to sustain.” *Microsoft Corp. v. I4I Ltd. P'ship*, 564 U.S. 91, 111 (2011) (internal citation omitted).

A claimed invention is unpatentable if the differences between it and the prior art “are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art.” 35 U.S.C. § 103(a); *see also Graham v. John Deere Co.*, 383 U.S. 1, 14 (1966). The Supreme Court's most recent precedent supports such a finding here:

When there is a design need or market pressure to solve a problem and there are ***a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp.*** If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious under § 103.

*KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007) (emphasis added). The factual issues for the jury in assessing obviousness include: the scope and content of the prior art; differences between the prior art and the claims; the level of ordinary

skill in the art; and evaluation of any relevant secondary considerations. *Graham*, 383 U.S. at 17.<sup>2</sup>

## **2. The Priority Date of the Patents-In-Suit**

The Patents-in-Suit share substantially the same specification and claim priority to Application No. 12/847,917 (“’917 application”), which was filed in July 27, 2010. (*Id.*). The Patents-in-Suit are thus presumed to have an invention priority date of July 27, 2010. Fuma has the burden of proving an earlier priority date, and it claims a priority date of July 28, 2009. Regardless, the prior art relied on by Reynolds predates both dates.

## **3. The Purported Novelty of the Asserted Claims**

Each of the asserted claims require a two-piece electronic cigarette that has a power source (battery portion) and a cartridge. They further require as core elements:

- a housing (in the cartridge) having a centrally and axially extending airflow passageway;
- a solution holding medium that surrounds the central airflow passageway;
- an electrical connection that electrically couples the power source to a heating element in the cartridge; and

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<sup>2</sup> Word count restrictions preclude a detailed analysis of secondary considerations in this brief. However, the evidence will show they do not support validity.



- a heating element in the cartridge.

As shown in the chart below, there is one primary difference between the asserted claims as concerns their purported novelty. It involves the placement and characteristics of the heating element:

<b>Patent Claims</b>	<b>Heating Element Requirements</b>
<b><u>'604 Patent Claim 4 and '881 Patent Claim 1</u></b>	"the heating element extends transversely across the airflow passageway, whereby the airflow through the passageway passes on both transverse sides of the element"
<b><u>'881 Patent Claim 8</u></b>	"the heating element being within and extending transversely across the airflow passageway," whereby the airflow through the passageway passes "on both transverse sides of the element"
<b><u>'604 Patent Claims 6 and 14</u></b>	the heating element merely needs to be located in the "interior of the housing," and "comprises a wicking material to attract the solution from the solution holding medium to the heating element"
<b><u>'604 Patent Claim 12 and 18</u></b>	the heating element merely needs to be located "in the interior of the housing," but does not need to "comprise a wicking material to attract the solution from the solution holding medium to the heating element"
<b><u>'604 Patent Claim 16</u></b>	"at least a portion of the heating element extends in the airflow passageway"

(Dkts.76-2,3).<sup>3</sup>

During his deposition, Fuma's CEO and the first named inventor of the Patents-in-Suit, Greg Conley, acknowledged that the prior art Smoke 51 Duo that he sold, and in fact inspected prior to Fuma's claimed invention date, had the following core elements: (a) a two-piece electronic cigarette that had a battery portion and a cartridge portion that were electrically and mechanically connected by a threaded portion (Ex. A, Conley Dep. at 53:20–55:13); (b) a central airflow channel that extended axially through the center of the cartridge (*Id.*, at 39:25-40:14); and (c) a solution holding medium that surrounded the central airflow channel (*Id.* at 46:11-21).<sup>4</sup>

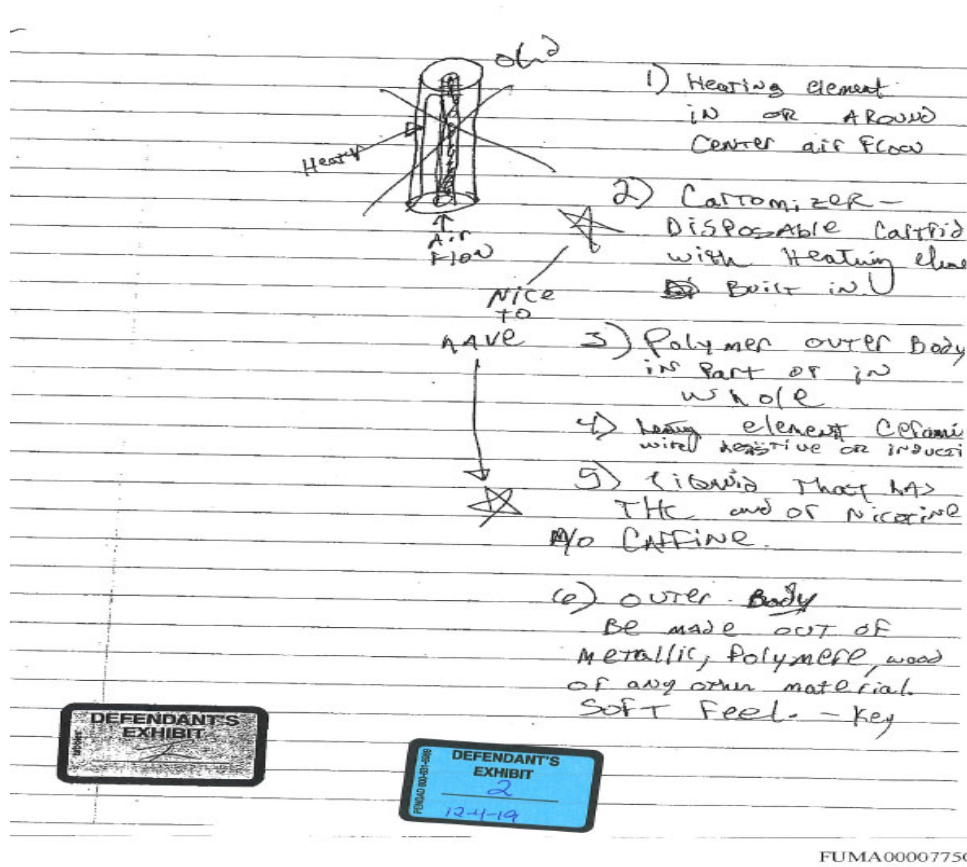
Mr. Conley claims, however, that when he inspected the product he determined that the heating element was located in batting material that held the liquid nicotine solution *outside of the central airflow channel*, and thus the heater burned the batting material and created a burnt aftertaste. (*Id.* at 79:14–81:25;

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<sup>3</sup> The Court will recall that the asserted claims of the '604 patent require that the portions that electrically and mechanically connect the cartridge to the power source be "threaded," whereas the asserted claims of the '881 patent do not expressly state that such portions are "threaded." Both threaded and non-threaded connections were prevalent in the prior art, and this is not a material distinction for purposes of validity.

<sup>4</sup> Fuma also admitted in discovery responses and pleadings that the Smoke 51 Duo had these core features. (Dkt. 55 at ¶¶104-106).

268:10-269:5). Mr. Conley testified that his “aha” moment was determining that the heating element should be moved from the batting material to the inside of the airflow channel so the “vaporization process actually takes place in the actual airflow.” (*Id.*). Mr. Conley claims that he sketched the interior of the Smoke 51 Duo’s cartridge he inspected prior to filing any patent applications. According to Mr. Conley, that sketch shows the heater in the batting material outside of the airflow channel, along with his notation to place the heating element “in or around center airflow” (*Id.*, at 31:16–33:19; 40:12-14):

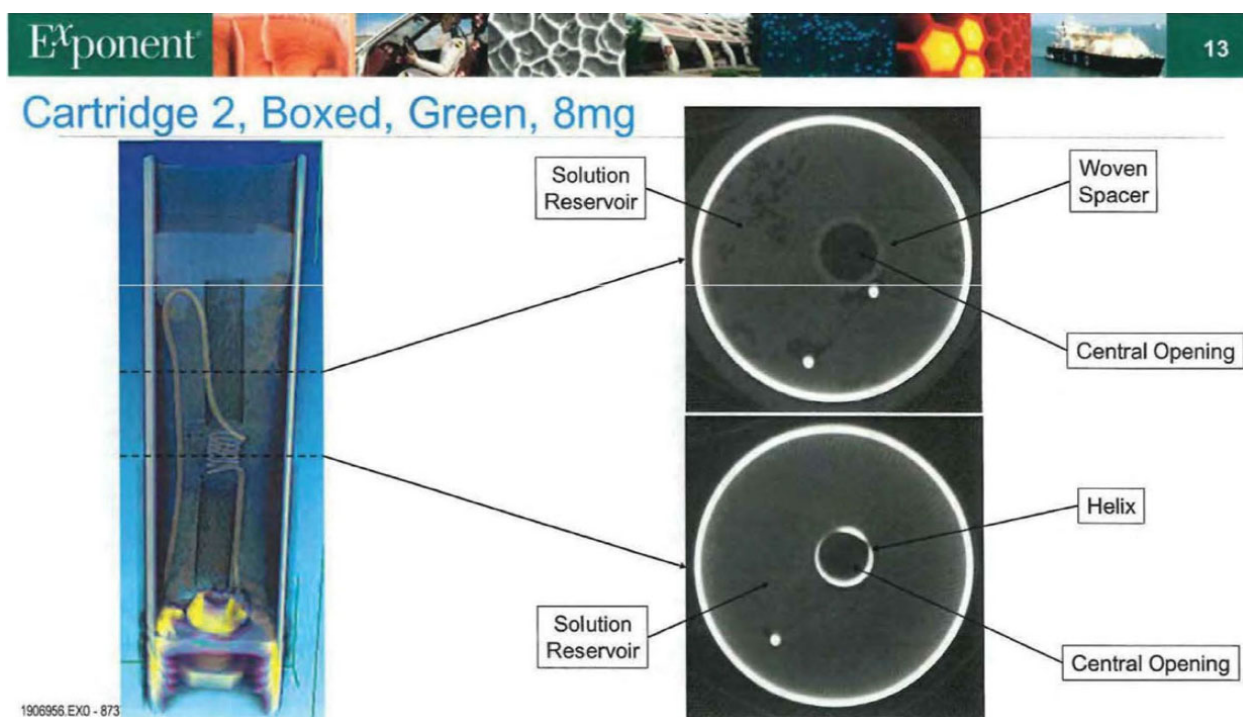


Assuming *arguendo* that Mr. Conley's testimony is true, it proves his purported invention was nothing more than moving the heating element from the outside to the inside of the airflow channel so liquid would be vaporized there.

During prosecution, the PTO did not have the relevant information about the internal structure of the Smoke 51 Duo. Rather, in an effort to overcome a rejection from the PTO, Fuma informed the examiner that the prior art did not teach an e-cigarette having the combination of a: (1) central airflow passageway, (2) surrounded by a solution holding medium, and (3) threaded electrical connections. (Dkt. 57-1 at FUMA00000166). The patent examiner then allowed the claims.

#### **4. The Smoke 51 Duo's Heating Element**

At trial, Reynolds will prove that the Smoke 51 Duo's heating element was actually located in the central airflow channel. Reynolds obtained samples of the Smoke 51 Duo from the man who invented them (Shanhong Wang) that have the same design as the Smoke 51 Duo that Mr. Wang sold into the United States in 2008-2009. At his trial deposition, Mr. Wang confirmed that the heating element in those samples was located in the central airflow channel and used a wick to draw liquid from the solution that surrounded the airflow. (Ex. B, Wang Dep. at 62:4-66:5). Forensic images of the interior of those samples confirms this fact:



(Ex. C, Ex. 5 to Wang Dep.).

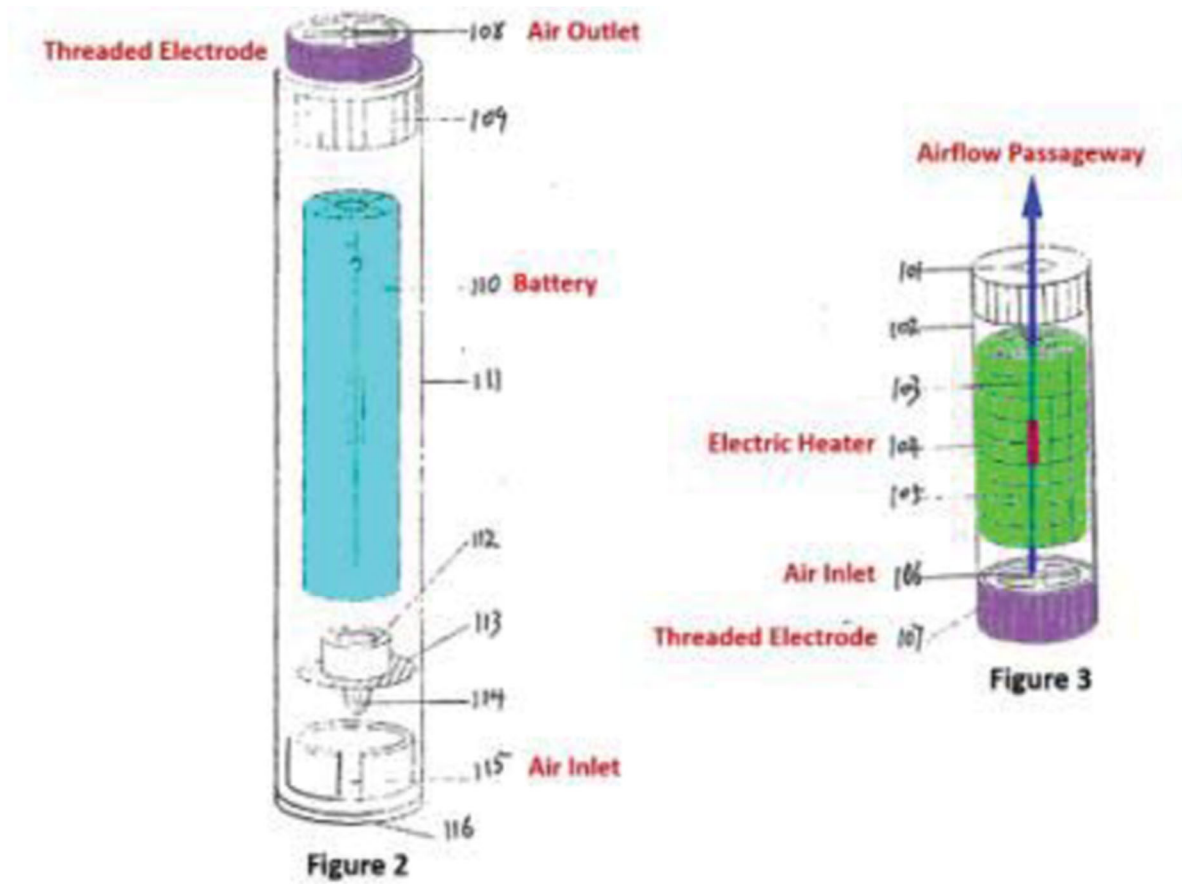
## 5. Other Prior Art

Numerous other prior art devices also taught placing a heating element in a central airflow (including transversely across the airflow), and using a wick to draw liquid to the heater so it would be vaporized in the airflow. Primary examples follow:

### a) Wang '554 Application

On February 18, 2009, the Wang '554 Application (also referred to as the '948 Application) published disclosing a two-piece electronic cigarette having a battery and cartomizer connected by screw threads, a central airflow surrounded by a liquid

nicotine solution, and a heating element placed in the center of the airflow.<sup>5</sup> The relevant figures (as annotated) are below:



Although Fuma contends that the '554 Application does not disclose a central airflow channel, and instead merely discloses wrapping a heater tightly inside the

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<sup>5</sup> At his deposition, Mr. Wang confirmed that the '554 Application discloses all of those elements. (Ex. B, at 12:2-25:9).

tobacco extract (shown in green above), the express language of the '554 Application tells a different story:

The inside of the shell 102 is the electric heater 104 and the tobacco extract 103 and organic fiber 105 entwined around it, *which provides space and also provides space for smoke produced by electric heater 104* when heating tobacco extract 103 in the organic fiber 105. . . .

...

The air inlet 115 of the cigarette holder, gap in the cigarette holder, air outlet 108 of the cigarette holder, *air inlet 106 of the mouthpiece, gap in the mouthpiece and air outlet 101 of the mouthpiece compose a full air flow channel.* . . .

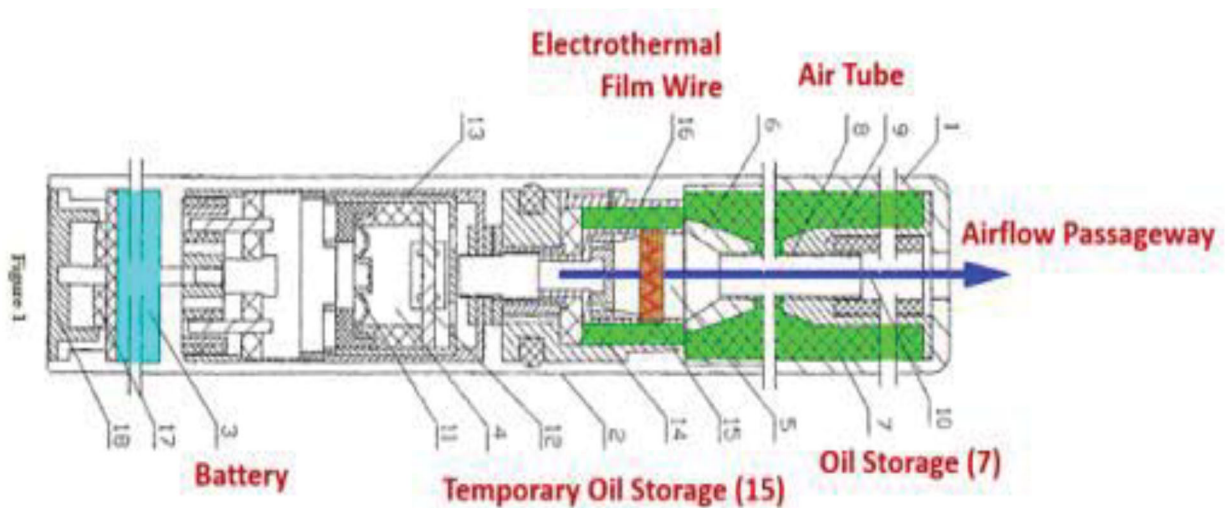
(Ex. D, Wang '554 Application at 3-4)(emphasis added). The “space” or “air flow channel” is the central airflow passageway that extends along a central longitudinal axis from the air inlet to the air outlet. Mr. Wang further confirmed that his '554 Application discloses a heater placed in a central airflow channel surrounded by a liquid nicotine solution. (Ex. B, at 12:2-29:4).

**b) Fang '044**

Fang '044 was published on July 16, 2008. (Ex. E, Fang '044 at 1). As shown in annotated Figure 1 below, Fang '044 discloses an electronic cigarette with a mouthpiece 1 and casing 2. *Id.* at 8, Fig. 1. The mouthpiece includes a central air tube 8 connected to an air passage 10 to form a smoking passageway surrounded by a nicotine oil storage 7. The central air passageway of the mouthpiece is in airflow



communication with a central airflow passageway of casing and a nicotine fuming device 5 located in the central air passageway of the casing. Additional nicotine oil storage 14 surrounds the central air passageway of casing, is in communication with nicotine oil storage 7, extends along the outer wall of the nicotine fuming device and supplies nicotine oil to the temporary oil storage 15 (wicking material) extending transversely across the air passageway and wrapped with coiled electrothermal wire 16 that are supplied with electrical current via a battery 3. (*Id.*,at6).



In operation, the smoker's inhalation activates the circuit board triggering the supply of electrical current to the heating wire 16 to generate vapor in the airflow formed from the solution in the wicking material 15, which vapor travels through the air passageway for inhalation by the smoker. (*Id.*). As Fang '044 also notes, the disclosed transverse heating element/wick configuration is a thermally efficient way



for vaporizing the nicotine-containing oil, and provides motivation to a POSITA to use this design option in an electronic cigarette. *Id.* at 5.

c) **Han '311**

Han '311 was published on April 16, 2009. (Ex. F, Han '311 at 1). As shown in Figure 1 below, Han '311 discloses an electronic cigarette that includes, among other things, a battery assembly, an atomizer assembly, and a cigarette bottle assembly. (*Id.* at ¶63).

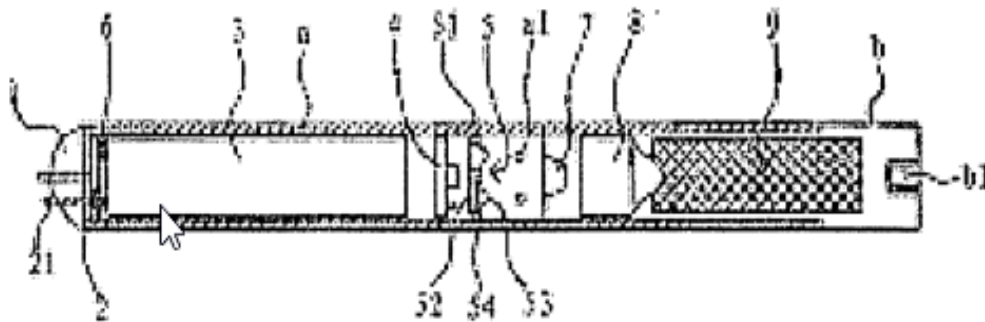
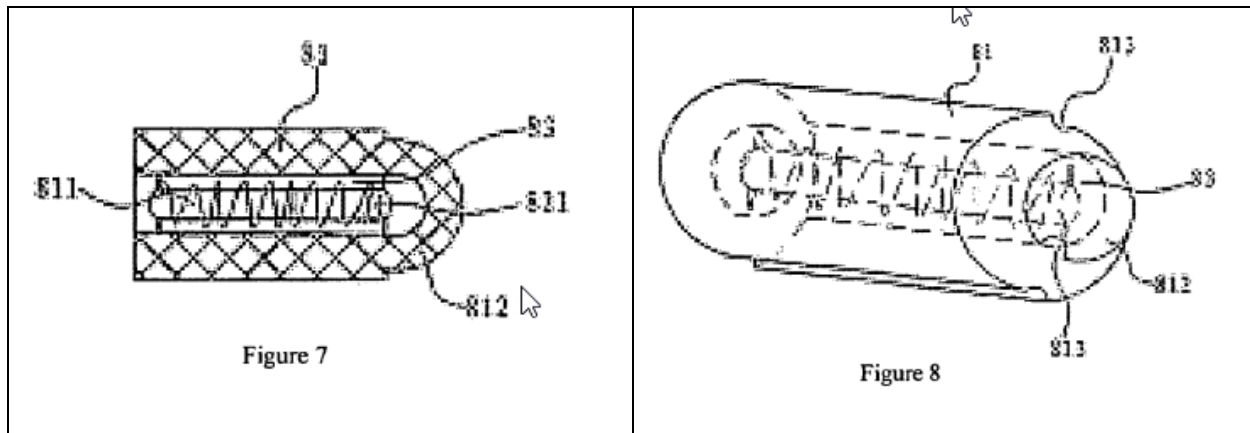


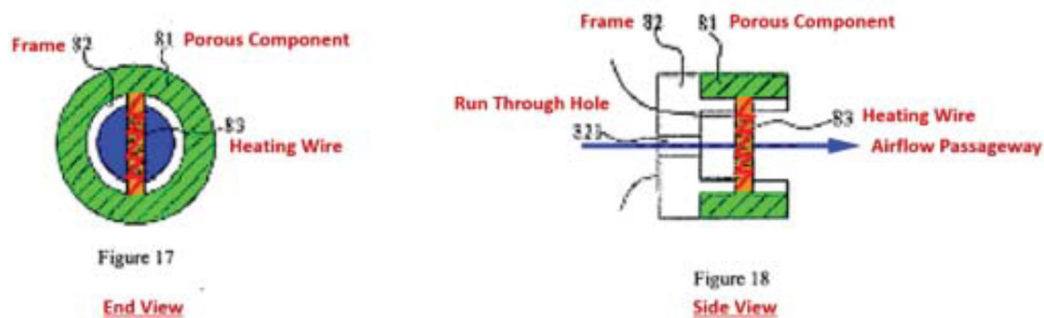
Figure 1

As illustrated in Figures 7, 8, and annotated Figures 17-18 below, Han '311 teaches alternative atomizer configurations where the heating element is positioned either axially or transversely to airflow through the atomizer. For example, Figures 7-8 describe a configuration with a central airflow channel surrounded by a solution holding medium 81 and a heating element 822 positioned axially in and parallel to airflow through a central airflow passageway. (*Id.* at ¶66). The solution holding

medium includes a protuberance 812 that contacts and pulls liquid from the liquid-storing component to the heating element.



Figures 17-18 (annotated below) further describe an atomizer where the heating element is positioned transverse to airflow through a central airflow passageway in the atomizer. (*Id.* at ¶178).



#### d) Brooks '874

Reynolds invented the Brooks '874 Patent, which issued over 30 years ago. (Ex. G, Brooks '874 at 1). It covers electric “smoking articles which generate

flavored vapor and/or visible aerosol” (*Id.*, at Col 1:1-51), and teaches placing a heating element (18) across a central airflow passageway (83) so that liquid is vaporized there before passing through a tobacco substance and being inhaled. (*Id.*, at Figs.4-6,Col.10:34-58,Col.11:42-49).

U.S. Patent Aug. 14, 1990 Sheet 4 of 8 4,947,874

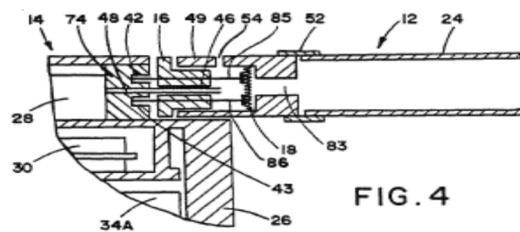


FIG. 4

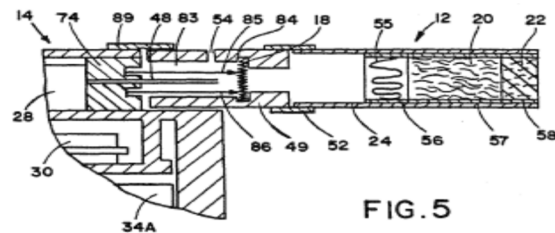


FIG. 5

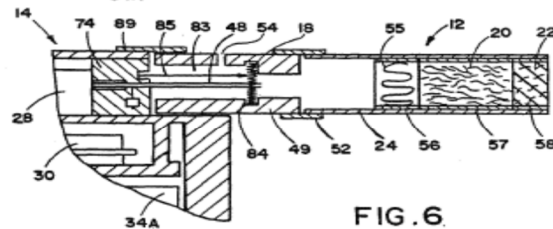


FIG. 6

RJRV-F000061486

\* \* \*

Based on these and other prior art references, Reynolds believes that clear and convincing evidence demonstrates that, at a minimum, it would have been obvious to a person of ordinary skill in the art to modify either the Smoke 51 Duo or the Wang 554 patent application to reposition the heating element as claimed with the reasonable expectation of eliminating a burnt flavor and achieving efficient vaporization. The claims are thus invalid.

## **B. Derivation**

A patent claim is invalid under pre-AIA 35 U.S.C. § 102(f) if the alleged inventor did not himself invent the claimed subject matter, but instead derived the claimed invention from another. Here the evidence will show that Mr. Conley derived the key limitations from the Smoke 51 Duo that he was selling prior to his alleged invention. Moreover, as discussed above, Mr. Conley at most merely re-positioned the heating element of the Smoke 51 Duo to be transverse to airflow through the central airflow passageway. However, placing a heating element transverse to airflow through a central airflow channel was a well-known design option disclosed in the prior art, including for example in Han '311 and Fang '044, as well as the Brooks '874 Patent (which Reynolds provided to Mr. Conley before he filed his patent application). Thus, the asserted claims are also invalid under pre-

AIA 35 U.S.C. § 102(f) because Mr. Conley at best merely made an obvious modification to the claimed features he derived from the Smoke 51 Duo.

### **III. Infringement**

#### **A. Legal Standards**

It is the patentee's burden to prove infringement by a preponderance of the evidence. *Morton Intern., Inc. v. Cardinal Chemical Co.*, 5 F.3d 1464, 1468 (Fed. Cir. 1993). "If even one limitation is missing or not met as claimed, there is no literal infringement." *Mas-Hamilton Group v. LaGard, Inc.*, 156 F.3d 1206, 1211 (Fed. Cir. 1998).

Infringement under the doctrine of equivalents ("DOE") may be found "where the differences between the claimed elements of the patented device and the accused product are insubstantial." *Interlink Electronics v. Incontrol Solutions, Inc.*, No. 98-1567, 1999 WL 641230, at \*2 (Fed. Cir. Aug. 24, 1999). "One test used to determine 'insubstantiality' is whether the element performs substantially the same function in substantially the same way to obtain substantially the same result as the claim limitation." *Id.* Further, "[t]he Supreme Court emphasizes that the doctrine of equivalents must not expand to eliminate a claim element entirely." *Planet Bingo, LLC v. GameTech Intern., Inc.*, 472 F.3d 1338, 1344 (Fed. Cir. 2006).

“Prosecution history estoppel applies as part of an infringement analysis to prevent a patentee from using the doctrine of equivalents to recapture subject matter surrendered from the literal scope of a claim during prosecution. Prosecution history estoppel can occur in two ways: either (1) by making a narrowing amendment to the claim (amendment-based estoppel) or (2) by surrendering claim scope through argument to the patent examiner (argument-based estoppel).” *Amgen Inc. v. Coherus BioSciences Inc.*, 931 F.3d 1154, 1159 (Fed. Cir. 2019) (internal quotations omitted). Prosecution history estoppel can extend from a parent to a child application and between sibling applications (those that claim priority to the same parent application). *See Microsoft Corp. v. Multi-Tech Systems, Inc.*, 357 F.3d 1340, 1349-50 (Fed. Cir. 2004).

When a patentee narrows the claims by amendment, the patentee is presumed to have disclaimed “the territory between the original claim and the amended claim.” *Pharma Tech Solutions, Inc. v. LifeScan, Inc.*, 942 F.3d 1372, 1380 (Fed. Cir. 2019). Further, argument-based estoppel applies when the patentee makes “a clear and unmistakable surrender of subject matter” during prosecution. *Pharma Tech*, 942 F.3d at 1380. In determining whether prosecution history estoppel applies, the relevant inquiry is “whether a competitor would reasonably believe that the applicant had surrendered the relevant subject matter,” not whether the amendment was

“actually required to secure allowance of the claim.” *Id.*; *see also Felix v. Am. Honda Motor Co., Inc.*, 562 F.3d 1167, 1182-83 (Fed. Cir. 2009).

**B. Claim Language, Specification, and Prosecution History of the '604 Patent**

The remaining infringement issue for trial is whether the VUSE Solo infringes claims 4, 6, 12, 14, 16 or 18 of the '604 patent. The key language from those claims requires a cartridge housing end having an electrically conductive *threaded* portion adapted to mechanically and electrically couple to an electrically conductive portion of a power source (paraphrased). (Dkt.76-2, at 17:15-54, 18:26-59).

During prosecution, in an effort to persuade the PTO to grant the patent, Mr. Conley and his patent counsel expressly distinguished threaded connections from other types of connections (*e.g.*, snap fit connections or locking mechanisms). Specifically, the '604 patent is a continuation of and claims priority to U.S. Patent Application No. 12/843,917 (“the '917 application”). The original claims of the '917 application claimed a generic electrical connection as opposed to a threaded electrical connection. The examiner rejected those claims in-part because at least one prior art reference (Thorens) had a locking mechanism in which the “electrical contacts 113 located near the first end (left side in figs. 1 and 3) inherently connect to positive and negative terminals on the battery which provides power to the heating

coil 209.” (Ex. H, ‘917 Prosecution History, at FUMA00000481-82). In an effort to distinguish the invention from a locking mechanism, Mr. Conley and his patent counsel removed the generic electrical coupling language of the claims and added the “electrically conductive threaded portion” language that ultimately issued:

aperture of the housing, wherein the first end of the housing includes an electrically conductive threaded portion that is adapted to mechanically and electrically couple to the electrically conductive threaded portion of the power source, ÷

wherein the housing includes a solution holding medium comprising a solution located in the interior of the housing, wherein the solution holding medium surrounds the airflow passageway in the interior of the housing, ÷ ~~and~~

wherein the housing includes a heating element located in the interior of the housing, ~~wherein the first end of the housing comprises a conductive material that is adapted to electrically couple an electrical power source to the heating element,~~ wherein the heating element is electrically configured to vaporize at least a portion of the solution for oral provision to the individual from the second aperture responsive to electrical power received from the battery through the electrically conductive threaded portions of the cartridge and power source.

(*Id.*, at 551-552). Mr. Conley and his patent counsel then expressly distinguished the claimed threaded connection from a locking mechanism, arguing that “none of the applied art shows a cartridge (including a solution and a heating element) that *is threadably coupled to a power source. For example, Thorens merely shows an*



*unexplained lock mechanism 117* (e.g., see Figure 1). . . .” (*Id.*, at 561-62) (emphasis added).<sup>6</sup>

Consistent with that history, the ‘604 Patent’s specification expressly distinguishes threaded connections from other types of connections, such as snap fit connections or locking mechanisms. For example, the specification identifies a “*threaded fastener*, a magnetic connector, a twist cap connector, *a push-on connector*, *a quick-lock connector*, a t-bar connector, a half-turn lock” as being “*dissimilar*” types of connectors. (Dkt.76-2, at Col.10:47-54) (emphasis added).

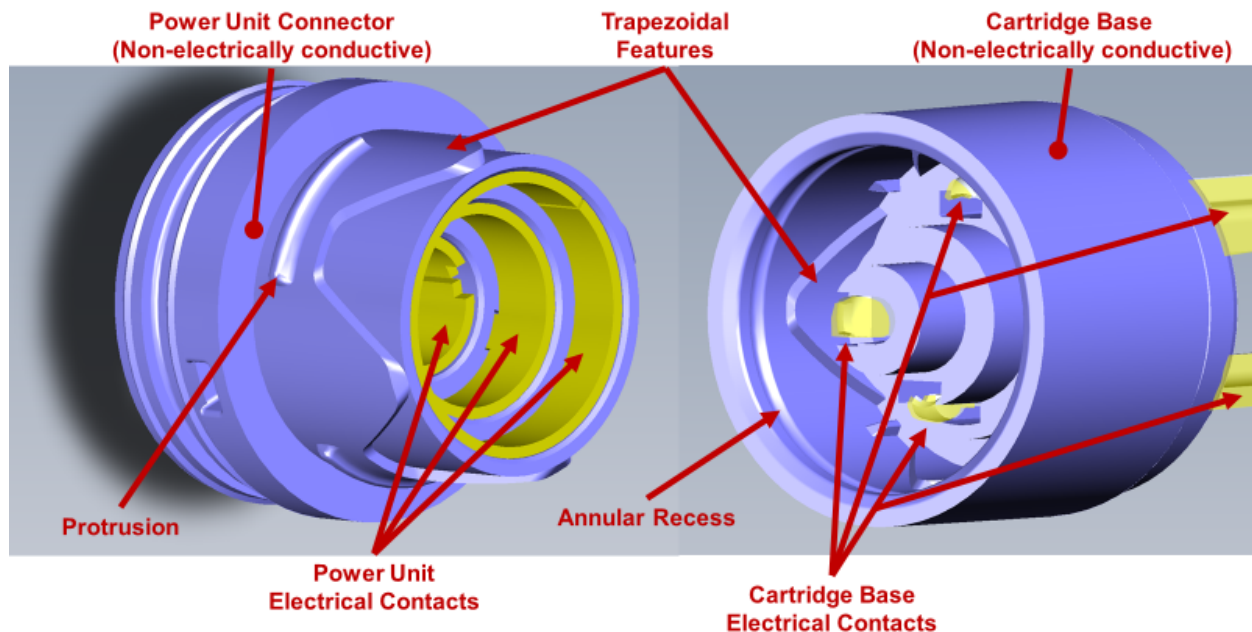
As detailed below, the VUSE Solo does not infringe the ‘604 patent because it has no threaded portion, much less a threaded portion that electrically and mechanically connects the cartridge to the power source. It instead uses something akin to a quick-lock connector.

### C. Literal Infringement

The VUSE Solo does not literally infringe the ‘604 patent. The features that electrically and mechanically connect the Solo’s power unit to the cartridge are shown below:

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<sup>6</sup> Thorens describes its locking mechanism as follows: “The shell 101 and mouthpiece 201 are releasably locked together by a lock mechanism 117.”



Fuma contends that the trapezoidal features constitute “threads,” and thus meet the requirement that the “electrically conductive” portion be “threaded.” As will be demonstrated at trial, the trapezoidal features are not “threaded,” nor are they “adapted to mechanically couple” the cartridge and power source. Unlike threads, the trapezoidal features perform no connection function whatsoever, and are instead designed to limit rotation when the protrusions snap into the annular recesses. This is consistent with the Court’s findings that the Solo’s power unit connects to the base through the “series of rings with protrusions and recesses that snap into each other when pressed together,” rather than via the trapezoidal features, which the Court recognized “prevent the cartridge and power source from rotating” when they are connected. (Dkt. 139, at 3-4).

## **D. Infringement Under the Doctrine of Equivalents**

### **1. Prosecution History Estoppel**

Both amendment and argument-based estoppel preclude the application of the DOE to the “electrically conductive threaded portion” limitations. With respect to amendment-based estoppel, these limitations were added by narrowing amendments. As such, Fuma is presumed to have disclaimed devices that lack the claimed “electrically conductive threaded portion.” *See Pharma Tech*, 942 F.3d at 1380.

Fuma cannot overcome this presumption. Non-threaded electrical connections were foreseeable. Indeed, as Fuma argued during prosecution, Thorens disclosed an electrical connection that lacked threads. As detailed above, the ‘604 patent’s specification actually distinguishes between various types of connections, referring to “threaded fastener, a magnetic connector, a twist cap connector, a push-on connector, a quick-lock connector” as “dissimilar.” Further, to overcome a rejection Fuma moved away from original claim 20 of the ’917 application, which did not require threads.

Nor can Fuma reasonably argue that the amendments bore no more than a tangential relation to the equivalent in question in this case; namely, non-threaded electrical connections. To the contrary, the electrically conductive threaded portion

limitations were specifically added and relied upon to distinguish over Thorens and the other cited art which, like the accused Solo, lacked threads. *See Lucent Techs., Inc. v. Gateway, Inc.*, 2007 WL 925354, at \*6 (S.D. Cal. Mar. 6, 2007) (“The amendment and the accused equivalent are not tangential because they fall into the very subject that was at issue in the prosecution.”). Finally, nothing suggests that Fuma could not reasonably have been expected to claim non-threaded electrically conductive portions, which it originally tried to do.

Argument-based estoppel also precludes application of the DOE. On multiple occasions Fuma distinguished Thorens on the basis that it had a “lock mechanism” and thus lacked the threaded electrical connection as claimed. Based on Fuma’s statements during prosecution, a competitor would reasonably believe that Fuma surrendered devices that had similar locking mechanisms rather than threaded connections.

## **2. No Infringement by Equivalence**

Fuma cannot meet its burden of proving that the trapezoidal features are equivalents to the claimed electrically conductive threaded portions. Indeed, the trapezoidal features do not perform any coupling function whatsoever. As the Court determined, that function is instead provided by the protrusions on the power unit connector and the annular recess on the cartridge base. (Dkt. 139, at 3-4). The

evidence will further show that the claimed electrically conductive threaded portions mechanically couple and de-couple the cartridge and the power unit (function) by converting rotational applied forces (*i.e.*, rotating in one direction to couple and in the other to de-couple) into axial movement of the cartridge and power unit with respect to each other (way) to achieve a mechanical coupling that resists de-coupling in response to an outwardly directed axial force (*i.e.*, where the user attempts to pull the two pieces apart) (result).

The trapezoidal features also work in a substantially different way to threads. In contrast to threads, which bring the cartridge and power source together and apart when rotated, the Court has already recognized that the trapezoidal features “prevent the cartridge and power source from rotating” when they are connected by the rings and protrusions. (Dkt. 139, at 3-4). The trapezoidal features also achieve a substantially different result. In contrast to the claimed threaded portions, which resist decoupling when the user attempts to pull the pieces apart and require rotational forces to be applied to decouple, the trapezoidal features do not. For at least these reasons, Fuma cannot meet its burden of proving infringement under the DOE. *See Aeroquip Corp. v. U.S.*, 37 Fed.Cl. 139, 145-46 (1997) (accused coupling that prevented movement within locking mechanism not equivalent to claimed coupling requiring movement).

#### IV. Willful Infringement

To establish willful infringement, Fuma must show by a preponderance of the evidence that Reynolds had a specific intent to infringe at the time of the challenged conduct (in this case, when the complaint was filed). *Bayer Healthcare LLC v. Baxalta Inc.*, 989 F.3d 964, 987 (Fed. Cir. 2021) (citing *Halo Elecs., Inc. v. Pulse Elecs., Inc.*, 136 S. Ct. 1923, 1933-34 (2016)). “Knowledge of the asserted patent and evidence of infringement is necessary, but not sufficient, for a finding of willfulness. Rather, willfulness requires deliberate or intentional infringement.” *Bayer*, 989 F.3d at 988. Fuma cannot meet this burden.

First, Reynolds has a long history of innovation in the tobacco industry, including innovation in aerosolization of nicotine dating back to at least 1990 with the Brooks patent. Reynolds commercialized early aerosol products such as Premier and Eclipse. In developing the Solo, Reynolds invested substantial resources, including the technical expertise of numerous scientists. The scientists involved in development of the Solo were generally unfamiliar with the Fuma device and did not copy it. To the contrary, the Solo is a highly innovative product reflecting new-to-the-world technologies.<sup>7</sup>

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<sup>7</sup> Reynolds was not even involved in the design of the *Ciro*, which it acquired from another manufacturer.

Second, Reynolds designed and commercially introduced the Solo long before the Patents-in-Suit issued. Further, Mr. Conley decided against providing Reynolds copies of his patent applications, nor did he otherwise provide Reynolds with any confidential information about the product design. When the accused products were designed, Reynolds therefore had no way of knowing whether Fuma would even obtain any patents, much less what the patented claims would cover.

Third, the evidence is that the Fuma samples Mr. Conley provided to Reynolds in 2010 did not have the subsequently patented design. The only evidence of Reynolds's understanding of the construction of those samples is a PowerPoint that Mr. Potter created at the time describing the Fuma product, and Mr. Potter's related testimony about same. Both show that Mr. Potter/Reynolds believed that the Fuma samples had a thicker, wickless elongated heating wire that extended axially into the airflow channel that consisted of a porous tube, rather than a normal-sized heating element extending transversely across an airflow channel that was non-porous. Indeed, Mr. Potter's testimony is that he believed the only unique aspects of the Fuma design were a "heavier gauge" heating wire, the lack of a "time delay cut-off," and the absence of a sweet aftertaste which he attributed to the ingredients of the nicotine solution. None of those are patented features.

Fourth, the Solo and Ciro look nothing like the Fuma product depicted in Mr. Potter's PowerPoint. Thus, to the extent the PowerPoint raised the prospect of creating an electronic cigarette "based on Fuma," that never occurred.

Fifth, despite becoming aware of the Solo product back in 2013, Mr. Conley and Fuma waited approximately six years before making any allegations that Reynolds was infringing Fuma's patents or allegedly copied the Fuma product samples, despite remaining in periodic contact with Reynolds. In fact, Fuma's patent counsel contacted Reynolds's patent counsel in 2018, and said nothing about alleged infringement. He instead asked Reynolds if it would like to buy or license the patents for use against a non-party. Reynolds declined, after citing the existence of prior art.

Finally, as explained above, Reynolds has always had a reasonable belief that Fuma's patents are invalid.

These factors weigh strongly against a finding of willfulness, particularly when combined.



## **V. Damages<sup>8</sup>**

### **A. Reasonable Royalty**

If a patent is valid and infringed, the patentee may seek “damages adequate to compensate for the infringement, but in no event less than a reasonable royalty for the use made of the invention by the infringer.” 35 U.S.C. § 284 (emphasis added). In this case, Fuma seeks damages solely in the form of a royalty, not lost profits or any other measure of damages.

In calculating a reasonable royalty, the patentee must apportion the value of the patented invention from the value of the accused product’s unpatented benefits and features in driving sales. Thus, where the patented invention represents an improvement to existing products, the patentee is only entitled to a royalty based on the incremental value provided by the patented improvement. *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1337 (Fed. Cir. 2009); *Exmark Manufacturing*

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<sup>8</sup> A threshold damages issue is when damages commence. Under 35 U.S.C. § 287(a), damages for infringement may be recouped only from the time the patentee either marked the product or notified the accused infringer of its infringement, whichever was earlier. Fuma bears the burden of proving compliance with the statutory marking requirement, which is a question of fact for the jury. Fuma claims that it satisfied the marking requirement by July 1, 2017. Reynolds contends that substantial compliance with the statute was not achieved until November 1, 2018. Both parties will present damages calculations based on both dates.

*Company, Inc. v. Briggs & Stratton Power Products Group, LLC*, 879 F.3d at 1348 (Fed. Cir. 2018) (“our law recognizes that a reasonable royalty award ‘must be based on the incremental value that the patented invention adds to the end product.’”); *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, 904 F.3d 965, 978-79 (Fed. Cir. 2018) (“If the product has other valuable features that also contribute to driving consumer demand – patented or unpatented – then the damages for patent infringement must be apportioned to reflect only the value of the patented feature.”).

Further, it is the patentee’s burden to show that the patented feature forms the basis for consumer demand. *Power Integrations*, 904 F.3d at 979. “It is not enough to merely show that the [patented feature] is viewed as valuable, important, or even essential to the use of the [infringing product].” *LaserDynamics v. Quanta Computer, Inc.*, 694 F.3d 51, 68 (Fed. Cir. 2012). “Where the accused infringer presents evidence that its accused product has other valuable features beyond the patented feature, the patent holder must establish that these features do not cause consumers to purchase the product.” *Power Integrations*, 904 F.3d at 979.

## **B. Fuma’s Damages Theory**

Based on these standards, the evidence will show that Fuma’s damages calculations are legally improper, grossly overstate the incremental value (if any) of the patented arrangement in driving sales, and would result in an unjust windfall for

Fuma. Indeed, at the hearing on Reynolds’s motion to exclude Mr. Holzen’s opinions, Fuma’s counsel acknowledged that Mr. Holzen attributed “*100 percent*” of the value of the accused products to the patented features. (8-25-2001 Trans., at 39) (emphasis added). That is exactly what the Federal Circuit has held is improper when the invention is merely an improvement of an existing product, or when the accused product has valuable features beyond those of the patented arrangement. Both indisputably apply here.

First, Mr. Holzen artificially inflates the value estimate by including the cost of conventional components such as the e-liquid, cartridge end cap and base, the electric terminals, external tube and substrate—all of which are unrelated to the “foundational concept” of the patented arrangement (a heating element and wick in a central airflow passageway). By including these five components, Mr. Holzen inflates his apportioned royalty rate by 74%.

Second, Mr. Holzen conflates component cost with the value of the patented arrangement, which inflates the royalty rate where more-costly components are used in the accused products - even though the choice of components has nothing to do with the value of the patented arrangement.

Third, component cost used by Mr. Holzen is a demonstrably unreliable proxy for the incremental value of the patented arrangement in driving sales. For example,

according to Mr. Holzen, the Solo Gen 1's stainless-steel cartridge housing (which cost on average 8 cents in 2017) is eight times more valuable in driving sales than Reynolds's proprietary e-liquid (which cost on average 1 cent in 2017). It defies common sense to suggest that the choice of housing material is more important in driving consumer demand than the e-liquid consumed by users—much less eight times more valuable.

Fourth, Mr. Holzen improperly commingles the enhanced value of the components as modified by Reynolds with the purported value of the patented arrangement. The accused products include e-liquids, heating elements, wicking materials, substrates for holding the e-liquids, and mechanisms for electrically and mechanically coupling the power source to the cartridge that are manufactured and designed according to Reynolds's requirements. Yet, Mr. Holzen does not account for the value of these components in driving sales independent of the patented arrangement, effectively assigning their entire value as derived from the patented arrangement.

Finally, Mr. Holzen fails to account for the other features that Reynolds added to the accused products in driving sales, assigning them zero value. These features include, for example, the SOLO's Smart Technology, which provides digital management and monitoring of the device operation for a "perfect puff, first time,

every time” and Reynolds’s patented QuickConnect feature that provides “unique and easy to use interface” between the cartridge and power unit, as well as other features, such as Reynolds’s proprietary e-liquid formulas, automated manufacturing and quality assurance processes, that are related to Fuma’s patents.

Mr. Holzen’s ultimate conclusion is that Fuma is entitled to a 14% royalty on the entire net revenue of the Solo and Ciro products. This equates to more than \$100 *million* in damages—80% of which is for projected future sales that will never occur. If accepted, Fuma’s damages demand would consume all but a sliver of Reynolds’s past profits from sales of the Accused Products, in addition to projected future profits that will not occur.

### **C. Reynolds’s Damages Theory**

By comparison, Reynolds’s damages expert (Ms. Distler) arrived at the incremental value of the patented arrangement in driving sales of Solo and Ciro primarily by considering actual consumer demand for various e-cigarette features, rather than the cost of components. Assuming that Fuma’s patents are found to be valid and that the Solo infringes the ’604 patent, Reynolds’s expert estimates that the patented arrangement contributes \$0.02 to the value of each unit, or 1% of net revenue. Reynolds’s final damages projections are set forth below.

#### **D. Lump Sum for Past and Future Damages**

As a final matter, Fuma wishes to ask the jury for a lump-sum royalty payment that covers the life of the patents (through 2030), instead of a running royalty calculated on a per-unit or per-sales basis. The evidence will show that such an award would be improper under the facts of this case. Indeed, Fuma's lump-sum demand is based on projections from 2017 that have already been disproven by over three years of data, and as will be demonstrated at trial, the projections will become even less reliable over time due to regulatory issues, market realignment, etc.

Based on the various infringement scenarios, Reynolds's expert offer her opinion on alternative reasonable royalty amounts for both past and future monetary damages, and reasons why injunctive relief is not appropriate.

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The undersigned hereby certifies that all counsel of record who are deemed to have consented to electronic service are being served with a copy of this through the Court's CM/ECF system on October 25, 2021.

/s/ John F. Morrow, Jr.

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